Name _____

Homework 3
Section 12.3

1. (5) Problem #16 on page 660 of the text.

   (a) _____ (b) _____ (c) _____ (d) _____ (e) _____

2. (3) Find an equation for the contour of $f(x, y) = 2x^2y + 5xy^2 - 116$ that goes through the point $(3, 4)$.

3. (4) Determine which of the functions below has/have the given shape as level curves.

   Lines _____ Hyperbolas _____

   Parabolas _____ Ellipses _____

   I. $f(x, y) = x^2 + 3y^2$ II. $f(x, y) = y - x^2$ III. $f(x, y) = x^2$

   IV. $f(x, y) = x - y^2$ V. $f(x, y) = x^2 - y^2$ VI. $f(x, y) = 2x + 3y$

4. (5) Sketch a contour diagram for $f(x, y) = x - 4 - y^2$ with at least four labeled contours.

5. (3) Is there a function of two variables whose $z = 0$ level curve consists exactly of the circles $x^2 + y^2 = 4$ and $x^2 + y^2 = 8$? If so, what is an example? If not, why not?